

**REMARKS*****Claim Rejections – 35 USC § 103***

The Examiner rejected Claims 1-6 as being obvious over Turner et al. (US 6,507,401) in view of Alvarez et al. (US 5,712,165). Reconsideration of this rejection is requested for the following reasons.

Claim 1 has been amended to clarify that the method more specifically relates to online analysis of bitumen compositions for determining asphaltenes content thereof or for determining solvent-to-bitumen ratio or density of solvent diluted bitumen. The claim has also been amended in subsection (b) to specify a double-pass transreflectance probe having a long light path. In light of the amendments to claim 1, claims 4 to 7 have been cancelled.

Turner discloses a method of analyzing fluids flowing through a downhole portion of a well using an instrumented section of pipe having a notch cut therein and with two windows for transmitting and receiving light. Although this instrumented section of pipe has some features that act in a similar manner to a probe, it is not the same as providing specifically a double-pass transreflectance probe as suggested in the present invention. There are no specifications given as to how long the notch should be to achieve an accurate reading. By contrast, the present invention specifies a double-pass transreflectance probe with a long path length. The long path length provides higher signal reproducibility and prevents sample temperature variation during spectrum data acquisition.

Furthermore, the probe of the present invention can be used to record data from both batch samples and in continuous flow processes, whereas the instrumented pipe section of the Turner et al. document appears to be used for flowing fluids only, specifically fluid flowing in downhole oil wells.

Furthermore, Turner et al. teaches the step of normalizing the measured light component intensities by dividing by a characteristic of the measured component intensities to reduce the effect of scattering. However, the present invention states, at page 7 that absorption is “the dominant light attenuation mechanism for asphaltenes in crude oil”, and scattering is not a significant phenomenon, therefore the steps of normalizing the data are not required in the

present invention. Rather, the present invention uses a section of the light spectra, and not a few distinct wavelengths, to predict compositions.

The Examiner asserts that Alvarez teaches a method and an apparatus for use with hydrocarbons that includes either a transmittance or transreflectance probe. However, the Examiner is requested to note that although Alvarez et al. suggests at column 18, lines 15-16 that the probe can operate in transreflectance mode, it does not specify a double-pass transreflectance probe. Furthermore, although Alvarez et al. mentions that “the fiber(s) are anchored so that there is an appropriate distance between the output end of the fiber(s) and the tip of the [probe] shield”, this is not the same thing as path length and the importance of a longer path length is not discussed, suggesting that this factor does not play an important role in the Alvarez et al. process.

Since the particular use of the present method for analyzing asphaltenes content, solvent-to-bitumen ratio and density of solvent-diluted bitumen together with the specific use of a double-pass reflectance probe having a long light path cannot be found when viewing a combination of both Turner et al. and Alvarez et al., Applicant respectfully submits that the combined reading of the two references would not lead a person skilled in the art to the present invention.

The Examiner asserts that the subject matter of claims 2, 3, 4, 5 and 6 are disclosed in Turner et al. The Examiner will note that claims 4, 5 and 6 have been cancelled from the claims set, thereby overcoming any objections in this regard. Regarding claims 2 and 3, these claims ultimately depend upon claim 1, which teaches a number of unobvious features over Turner et al. and Alvarez et al., as described above. Read in the context of independent claim 1, dependent claims 2 and 3 cannot be considered to be disclosed by Turner et al., and the Examiner is requested to respectfully reconsider his objection.

The Examiner rejects claim 7 as being unpatentable over Turner in view of Alvarez and further in view of Tubel et al. (US 6,281,489). Claim 7 has been cancelled from the claims set thereby overcoming the Examiner’s objection in this regard.

The Examiner rejected claims 8 and 9 as being unpatentable over Turner in view of Alvarez and further in view of Wilt et al. (US 6,087,662). Reconsideration of the Examiner's rejection is requested for the following reasons. As submitted earlier, the transreflectance probe of the present invention together with the long light pass for use in the particular analysis of bitumen compositions and in particular asphaltenes content, solvent-to-bitumen ratio and density, would not be obvious with the combined view of Turner in view of Alvarez. Furthermore, Wilt et al. does not teach the particular transreflectance probe used in the method of the present invention and therefore the subject matter of claims 8 and 9, taken in view of the claims upon which these claims depend, cannot be considered to be taught by a combined reading of the cited references.

The Examiner rejects claim 11 as being unpatentable over Turner in view of Alvarez and Wilt and further in view of Tubel. Reconsideration of the rejection is respectfully requested for the following reasons. The Examiner asserts that Tubel teaches the use of spectroscopic equipment to determine the density of a chemical composition. However, the feature of a particular transreflectance probe with a long light path for use in determining the density of a bitumen composition in particular is not taught in Tubel et al. and cannot be found through a combined reading of Turner in view of Alvarez and Wilt. For this reason, the subject matter of claim 11, when taken in light of the claims upon which this claim depends would not be obvious having regard to the cited references.

The Examiner rejects claims 12, 13 and 17 as being unpatentable over Turner in view of Alvarez and Wilt and further in view of Mullins et al. (US 2002/0139929). Reconsideration of this rejection is respectfully requested for the following reasons.

The Examiner asserts that Mullins teaches that the source wavelength is in the ranges of 900nm-1700nm and 1000nm-1100nm. However, as argued earlier, these claims must be read in the context of the claims upon which they depend. Read in such a manner, the specific features of claim 1, which are not taught in Turner et al., Alvarez et al., Wilt et al., or Mullins et al., would not be obvious in light of these cited references.

As to claim 17, the Examiner asserts that Mullins teaches a system that is understood to be highly stable and free of any moving parts. However, Mullins does not teach a double-pass transflectance probe for use in the analysis of specific features of bitumen compositions, which teachings cannot also be found in a combined reading of the other cited references. For this reason, subject matter of claim 17 would not be obvious in light of the cited references.

The Examiner rejects claim 15 as being unpatentable over Turner in view of Alvarez, Wilt and Tubel and further in view of Mullins. Reconsideration of the rejection is respectfully requested for the following reasons.

The Examiner asserts that Turner discloses that the source wavelength is in the range of 1000nm-1600nm and that it would be obvious to a person skilled in the art to use the wavelength ranges of Mullins as the output ranges for the source taught by Mullins in the apparatus of Turner in view of Alvarez, Wilt and Tubel. Although Turner teaches a similar wavelength to the present application, Applicant respectfully submits that Turner does not teach the probe used in the present invention, nor would this probe be obvious in view of Alvarez, Wilt or Tubel. For this reason, a reading of Mullins in light of Alvarez, Wilt and Tubel with regard to Turner would not lead to the method of this claim as read in the context of the claim upon which this claim depends.

*Allowable Subject Matter*

It is noted that the Examiner objected to claims 10, 14 and 16 as being dependent upon a rejected base claim. Since the Examiner's rejections have been addressed above, no amendments have been made to claims 10, 14 and 16.

Respectfully submitted,

Shohini Bagchee  
Reg No. 55,959  
Tel. (613) 237-5900  
Our File 47911-A  
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